

The Open Channel

Spring 2009 Vol. 20 / Issue 1

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Annual CASFM Conference

By Robert Krehbiel, Conference Chairman

CASFM explored a new venue by selecting Crested Butte for the site of our annual conference in 2008. At 9400 feet elevation, Crested Butte fit the theme of "High Elevation—Low Impact, Sustainable Stormwater Management." Although there was concern expressed on the travel distance, we were very pleased to report a record number of participants at about 300, which is the largest ever except for the joint Arid Regions Conference in 2007. Crested Butte offered great Rocky Mountain fall scenery, unparalleled hiking and mountain biking opportunities and wonderful small town shops and restaurants. The conference was deemed a great success and we thank everyone that made time to participate in the event.

Highlights of the CASFM conference included:

- Three sponsored and fully catered Social Events,
- An amazing 41 total technical presentations,

- Dr. Tom Ballestero's keynote presentation on Low Impact Development, and
- Selection of Denver's Montclair Storm Drainage Project as the 2008 CASFM "Grand Award for Engineering Excellence" (See separate article)

Dr. Ballestero, professor of hydrology at the University of New Hampshire, was well received by the membership in general. He traveled to Colorado for this conference and discussed his research into stormwater management from the perspective of water quality impairments and low impact development technologies (LID).

Concerns were expressed by the attendees about the construction noise. The conference facility was being remodeled last year and we do not expect this to be an issue in 2009 when CASFM returns to the same facility once again. In 2009 we will get larger rooms for break-out ses-

sions and keep the rooms cooled appropriately.

There was also concern about too many technical sessions in one day. If you participated in the all-day Thursday sessions, you heard up to 14 technical presentations in one day. This may have been too much information too quickly. In an effort to provide a less rushed atmosphere and a little more time for questions, the number of technical presentations in 2009 will be limited.

The program was changed in 2008 to offer a more relaxing final day of the conference. Rather than more technical sessions, Friday morning was reserved for field trips. Although the trips were great, the weather did not fully cooperate. Intense mountain rain storms impacted some of the planned outdoor activities of mountain biking, a boat tour of Taylor Reservoir and a walking tour of downtown Crested Butte. We plan to reserve Friday for field trips again in 2009 and may include new activities such as horseback riding or ATV tours.





Greetings, CASFM members!

It never ceases to amaze me how time can fly, and this year is no exception. As I write this, we are receiving our first official measured snowfall in six weeks right in the middle of our allegedly snowiest period of the year. This follows a week with three days in a row of 74+ degree weather in February. I smirked as talk of global warming combined with the usual "I've never seen this before" dialogue.

To me, it simply serves as a reminder to expect the unexpected. Whether you work in the stormwater or floodplain arena, I would expect most of your work involves planning or design for infrequent or extreme events (the "unexpected"). When the rainfall disappears into the inlet or is held in the detention pond, or the urban stream quietly flows within its banks, little attention is paid to the "event". It is when the "unexpected" happens, that our policies, our criteria, our funding, and our technical prowess are tested. When the rainfall backs up into a storefront or a house in the floodplain becomes inundated, it indicates a possible failure of one of the items just listed. And that's when things get interesting.

It is not unlike our national economy right now. Just seven months ago, I never would have guessed that my 401(k) would have been cut in half by this time or that our state and country would be experiencing the fiscal problems we are undergoing. As we head into another flood season, this is a good lesson to remember.

Did you know that since 1900, Colorado has experienced a flood with resulting damages of at least \$40 million (in today's dollars) at least once in every decade except the 1940's? We haven't come close to a flood of this magnitude in the 2000's, leading many to adopt a false sense of security. "Perhaps our criteria is too strict." "Maybe we're spending too much money on a threat that really doesn't exist." "We're in the middle of a sustained drought—we don't need

to worry about flooding." "Maybe we've been over designing everything for the last thirty years."

I have heard each of the above statements over the past couple years. I believe them all to be wrong. As with the economy, nature has a way of reminding us when we become too complacent and unprepared. As the stewards and managers of our state's floodplains and stormwater facilities, it is up to us to make sure that we are prepared when the big one comes. That is, we expect the unexpected.

I am proud of the fact that we have not experienced a presidentially declared flood disaster in the past ten years. Very few states can say that. While it might be easy to dismiss this with the belief that it hasn't rained on this state since we were worrying about Y2K, I would beg to differ. In the past several years, I have personally had the pleasure of witnessing creative project designs, innovative modeling techniques, effective local preparedness, unprecedented coordination, and just all around smart thinking. While Mother Nature has certainly been kind to us in a relative sense, I believe THIS is the real reason we have done so well this millennium.

I hope you will consider joining us for our annual conference this year in Crested Butte. At our conference this year, we will be celebrating twenty years of our work and accomplishments and looking ahead to the unexpected for the next twenty. In these fiscally difficult times, it is as important as ever to stay on top of our work. Come learn what others are doing, and share what you have learned. And hopefully, the unexpected doesn't include snow and hail on our Friday field trips again.

Don't let your guard down. Fight to hold on to your funding—you'll have competition now. And most of all, continue to expect the unexpected.

Kevin Houck
CASFM Chair

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Montclair Storm Drainage Project

By Mike Galuzzi, WH Pacific, Tom Blackman, City of Denver, David Bennetts, UDFCD

Project Background

The Montclair Storm Drainage Project was a \$25 million endeavor by the City of Denver to improve the drainage in the Montclair Basin and to improve Ferril Lake in City Park. The project includes the conversion of Ferril Lake into a dual use facility (stormwater detention and recreation), associated park improvements, installation of a new storm sewer system in 17th Avenue, and a new storm sewer/road reconstruction on the City Park Esplanade in front of East High School.

The Montclair Basin consists of 9 square miles of fully developed urban land located east of downtown Denver. The basin is approximately 8.2 miles long, extending north from Fairmont Cemetery at its southern limit, to the outlet at the South Platte River near the Denver Coliseum. There is not a single open channel drainageway in the entire basin. Storm drainage is conveyed entirely in the streets

and through the existing storm sewer system, which is predominantly brick and was constructed in the 1930s. The storm sewer ranges in size from 10-inch lateral pipes to a 10-ft diameter main line at the outlet to the Platte River. Little has been done in the past to improve the drainage in the basin for the simple reason that the existing pipe system has less than a 2-year storm capacity. Enlarging the main stem, including the outfall, would be an expensive and difficult project. The main objectives of the Montclair Storm Drainage Project were to create adequate stormwater detention while also improving the park for recreational use.

The Park Planner for City Park was involved from the onset in the planning and design of the project. The conversion of the lake into a stormwater detention facility would have to improve the park aesthetically and functionally in order for it to be

viewed as a success by the public. In addition to the Park Department representatives, other agencies were also involved in the planning and design of the project. These agencies included the Urban Drainage & Flood Control District, the State Engineer's office, the Landmark Commission (for historic considerations), the East High School staff and parent organizations, Denver Zoo representatives, Museum of Nature and Science representatives, City Park Jazz, and local neighborhood groups. Two public meetings and a design charette were held to present the results of the planning and design processes and to receive public input.

WHPacific was selected to work with the City to create a Drainage Master Plan for the Montclair Basin. The Master Plan was completed in 2005, and project improvements were prioritized for the basin. The selected plan for the basin wide improvements



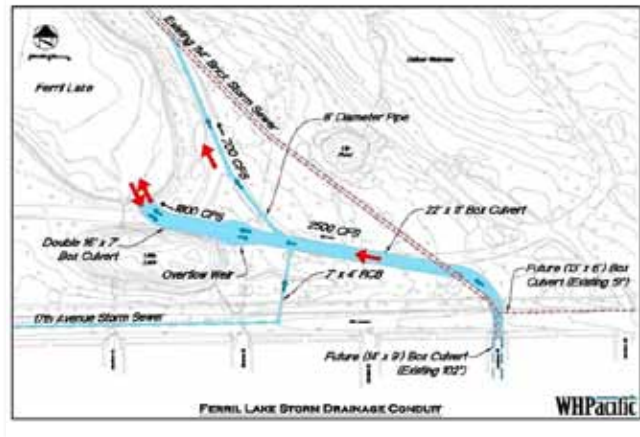
revolved around construction of a regional stormwater detention storage facility in City Park, which is centrally located in the Montclair Basin. Construction of a 120 acre-feet stormwater detention facility at City Park would dramatically reduce flows to downstream basin areas for 5-yr (and larger) storm events, thereby eliminating the need for \$25 million in upsizing costs for the existing storm sewer system.

The Montclair Storm Drainage project was constructed in three phases over a two-year period. The first phase involved reconstruction of the City Park Esplanade in front of East High School. The Esplanade is the historic “gateway” to City Park and is approximately 1,400 feet long, extending from Colfax Avenue to 17th Avenue. The project included removal of the entire street, installation of a storm sewer system, construction of an Entry Plaza at East High School, and reconstruction of the irrigation system and landscaping. The project design required the review and approval of Denver’s Landmark Commission to ensure that the project was reconstructed within the “historical context” of the City Park Esplanade.

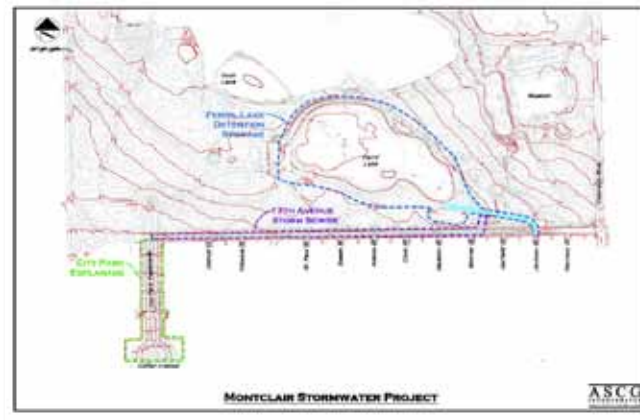
The second phase of the project involved the 17th Avenue Storm Sewer, which included installation of 3,500 feet of new storm sewer ranging in size from 24-inch RCP to 7-ft x 4-ft concrete box culvert. The 17th Avenue storm sewer connects to the new storm sewer in the City Park Esplanade, runs east along 17th Avenue, and enters City Park near the east end of Ferril Lake. The storm sewer upgrades were accompanied by street improvements which consist of reconstruction of eight intersections along a major city arterial. Upgrades also included rebuilding curbs, gutters, walks, handicap ramps, and 40 new inlets. This project utilized slotted drains, which serve as temporary inlets to augment the inlet capacity until upstream phases of storm sewer systems are installed.

The third phase of the project involved construction of the stormwater detention facility in Ferril Lake which includes an approximately 1,000 feet long cast-in-place drainage conduit that ranges in size from a 22-ft x 11-ft box culvert to a double 16-ft x 7-ft box culvert. The conduit collects water from the

upstream storm sewer systems and conveys flow into Ferril Lake via a large underground overflow weir structure. Designing an underground conduit/overflow weir structure that can divert 1,820 cfs into Ferril Lake during a 5-yr storm event was challenging; however, converting the historic Ferril Lake into a multi-use recreational/stormwater detention storage facility was equally as challenging.



Montclair Drain Construction Phasing



POND IMPROVEMENTS

In order to provide 120 acre-feet of temporary stormwater detention storage in Ferril Lake, the entire lake had to be reconstructed. This required some innovative design solutions. Due to the physical site constraints and other aesthetic considerations, the storage volume required had to be provided within the “footprint” of the existing lake. The lake level could not be lowered more than two feet below its normal pool elevation without noticeable visual impacts. Consequently, the “additional” storage volume had to be obtained by raising the embankment height. Existing landforms and mature trees did not allow space for placement of additional fill on the embankment.

Constructing the pond to get the required storage volume involved a two step approach. The normal lake level was lowered by 2 feet by means of excavation, muck removal, and reconstruction of the entire lake edge. Lowering the lake level also required that the Electric Fountain and irrigation intake structure be reconstructed. The effective embankment height was raised by adding an 18-inch high concrete seat wall, designed to run along the top of the embankment on the west and

north sides of the lake. The seat wall would provide the “effective embankment” height needed for the storage volume, while preserving the existing trees and landscaping around the lake. The wall was incorporated into the landscape design to be an attractive amenity that would enhance the beauty and form of the concrete walkway around the lake.

CONDUIT IMPROVEMENTS

Another innovative design solution involved the inflow conduit at the east end

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Diversion structure to existing brick storm sewer



Lake edge treatment



Reconstructed historic wall

of Ferril Lake. The inflow conduit collects storm-water from the upstream storm sewer systems, diverts flow into Ferril Lake for temporary detention, and bypasses smaller flows via an 8-ft diameter diversion pipe into the existing 114-inch brick storm sewer that runs through City Park. Due to the constraints of the normal pool elevation in Ferril Lake and the elevation of the existing 114-inch storm sewer and the adjacent ground elevation, the hydraulics of the underground spill/diversion into Ferril Lake was challenging. Minimum head was available for the overflow spill into the lake. Conventional hydraulic analysis did not provide adequate understanding of the losses involved in the spill/diversion structure.

To avoid a “conservative” approach that might oversize the structure and add considerable costs to the project, WHPacific used “FLOW-3D” modeling software to simulate a 3-dimensional model of the proposed Inflow Conduit and spill/diversion structure. Utilizing FLOW-3D, different shapes and sizes of the spill/diversion structure were modeled to determine the minimize size structure needed to spill the required flow of 1,820 cfs into Ferril Lake while minimizing hydraulic losses through the system.

PARK IMPROVEMENTS

The lake is the major focal point of City Park and

renovation of the lake required careful planning, coordination, and design to ensure that the changes to this 100-year old lake would not be perceived negatively. The project provided major upgrades to Denver’s historic City Park, the crown jewel of the City Park system. The upgrades include: a modern automated irrigation system, new concrete bike/pedestrian paths, several new plaza areas, a variety of lake edge treatments, reconstructed park roads, reconstructed historic wall and railing, reconstructed historic Electric Fountain, and renovation of the De-Boer Waterway.

The reconstructed lake provides improved areas for fish habitat and fishing, enhanced wetlands, and riparian habitat for wildlife around the lake edge. The Parks Department was heavily involved in selecting the different lake edge treatments that included wetlands, cobbles, blue grass with a concrete edger, and reconstruction of a portion of the historic wall. Other elements of the project included building the Pavilion Plaza, the Grand Staircase Plaza, and the View shedPlaza, and reconstructing Little Lake. The project also significantly upgraded the City Park Esplanade in front of East High School. This portion of the project entailed removal of the unsafe “back-in” diagonal parking. The road was reconstructed, with the addition of new curbs, gutters, and a new entry plaza. The irrigation system was rebuilt, and a

storm sewer system was added.

FOUNTAIN IMPROVEMENTS

The most unique aspect of the project was the reconstruction of the prismatic Electric Fountain in Ferril Lake. The fountain was originally constructed at the time of the Democratic National Convention that was held in Denver in 1908. It was recognized that the entire fountain structure needed to be reconstructed in order to maintain the historical appearance of the fountain with the new lower lake level. The original fountain was replaced with a replica that was identical in shape and dimension to the original design. The dedication of the rebuilt fountain took place on April 30, 2007. Mayor Hickenlooper, Bill Vidal (the Manager of Public Works), and Kim Bailey (the Manager of Parks and Recreation) were present to celebrate the rededication of the fountain. The reconstruction of the Electric Fountain, the irrigation intake structure, and the historic wall all met the historic preservation requirements and final approval of the Landmark Commission.

CONSTRUCTION OF IMPROVEMENTS

The Montclair Storm Project used an innovative process for contracting the construction activities. While plans were being developed to implement Phase 1 of the Montclair Basin Master Plan,

the City embarked on the Integrated Construction Program. The IC program enabled the city to hire a construction management contractor (IC contractor) to handle multiple projects simultaneously. The IC program removed many delays from the usual city “process” and allowed Denver the flexibility to quickly select contractors and begin work quickly, even before plans were entirely completed. The first implementation of the IC program in the Montclair Basin was on the City Park Esplanade.

Since the Esplanade is located in front of East High School, the project had to start on June 1 when school was no longer in session, and be complete by the time school started in early August. Normal contracting procedures would have delayed this project for at least an additional year. The flexibility of the IC program allowed the IC contractor to put the project out for bid while WHPacific finalized plans. Concrete Works of Colorado was selected for the project. The work was completed in early Au-

gust, a week before school was back in session.

One of the more challenging aspects of the project construction involved the completion of the work in Ferril Lake over a relatively short time frame (end of October to middle of April). Since Ferril Lake is the source of irrigation water for the entire City Park, work had to be completed during the non-irrigation season. Originally, it was assumed that the work would be completed over two construction seasons. Ultimately, we were able to complete the project in one season. To accomplish this, the contractor had to drain the lake at the end of irrigation season, remove 90,000 cubic yards of material (sediment and muck), reconstruct the lake edge, reconstruct the historic Electric Fountain, the irrigation intake structure and the historic wall, and refill the lake so that the park could be irrigated at the start of the following irrigation season.

The contractor did an outstanding job in removal of the lake material by using excavators on steel

mats, so that they would not sink into the muck. Haul roads were constructed on the lake bottom, and trucks were run 12 hours each day to remove the material. Multiple construction crews worked concurrently within the lake to lay pipelines, construct concrete walls, place rock riprap and cobbles, and construct the Electric Fountain.

CONCLUSION

The Montclair Storm Project was highly successful in creating a cost-effective solution to provide detention in a large, underserved basin. Construction of the Ferril Lake Detention Storage Facility saved the city \$25 million in upsizing costs for the downstream storm sewer system. The project also provided major upgrades to Denver’s historic City Park, the crown jewel of the City Park system, and serves as an outstanding example of successful multiple-objective effort.

A longer version of this article, with more photos, is available on the District’s website, udfcd.org.



CASFM Chair Kevin Houck presents the grand award to Tom Blackman (City & County of Denver) and Mike Galuzzi (WHPacific).



Friend of the District Award



Bill Taggart
1948-2008

The District has posthumously awarded the "2009 Friend of the District" award to Bill Taggart.

Throughout his 40-year professional career Bill was known for his commitment to excellence, as well as his awe for the beauty and power of moving water. Early on he completed a major water feature project at the Denver Botanic Gardens. He was

a partner in Wright McLaughlin and McLaughlin Water Engineers, and later owned his own company, Taggart Engineering Associates. He then rejoined his colleagues at WHPacific.

Bill worked on a number of high profile projects for the District, including the South Platte River Greenway, Confluence Park, and the Creek Front project on Cherry Creek to name a few. His biggest contribution to the District was the Drop Structure Criteria Manual he authored in 1986. Bill's recommendations were incorporated into the District's Criteria Manual, and are still in use today. We were saddened to hear of Bill's passing last year and he will be sorely missed

by his colleges and the District.

Bill was also a family man who loved rafting, kayaking, sailing and skiing. He taught skiing at Vail starting in the 1960s, founded the Copper Mountain Freestyle Society, and later was a guide with the Over the Hill Gang at Copper Mountain. He was often quoted as saying that achieving his Stage III ski instructor certification was more difficult than his professional engineering license exams.

Perhaps one of the greatest compliments that can be given by colleagues was extended by WHPacific in their on-line tribute, "We learned more from Bill than he would ever take credit for teaching."

District News

By David Bennetts, Urban Drainage and Flood Control District

There have been several personnel changes at the District recently. Ken MacKenzie, the Manager of the Master Planning Program, has added a staff position to the program. Holly Piza has been selected to fill this position. Holly brings 12 years experience to the District, and will be assisting Ken with stormwater quality and criteria development. The Floodplain Management Program has had staff changes recently as well. Terri Fead and Joanna Czarnecka have worked in the program for several years assisting with development review and approval. These positions had been contracted positions, and this year

they were turned into permanent positions.

The District is in the process of updating Urban Storm Drainage Criteria Manual Volume 3 "Best Management Practices". This volume of the Criteria Manual was first published in 1992, and has been revised and updated several times. This major update will include a number of changes and improvements including an expanded menu of BMP's; additional discussion of Low Impact Development (LID) and sample model ordinances; addressing proprietary devices; and economic analysis guidelines and life cycle cost information for BMP's. The up-

date process is being guided by two committees, a stakeholder's group and a technical advisory committee. All interested parties will have the chance to review and comment on the manual updates as they develop. To find out more, please visit our website: www.udfcd.org.

The District is also in the process of updating our website. Upgrades will include a new home page, improved navigation features, and better data exchange capabilities. The new website should be up and running by May 2009.

Low Impact Development Update

By Michelle DeLaria, Urban Drainage & Flood Control District

As the CASFM stormwater quality chairperson, I was excited to have “High Altitude and Low Impact Development” chosen as the theme of the 2008 conference in Crested Butte. Low impact development (LID) emerged 30 years ago in the sea-level location of Maryland. LID is a holistic planning, design, and construction process that seeks to reduce effective imperviousness (reduce runoff in the first place) and emphasize infiltration techniques that are designed to absorb small, frequent storms close to where runoff is generated. Other terms such as source volume controls, green infrastructure, and runoff reduction techniques are often used interchangeably with the term low impact development.

LID was created to achieve a higher level of water quality and waterway protection than standard flood control and water quality programs have achieved*. Even after 30 years, low impact development is evolving and being adapted to various climates, levels of urbanization, land development regulations and maintenance programs. As more

developers, engineers and planners apply LID techniques, the successes, failures, costs, cost savings, barriers and solutions emerge. The 2008 CASFM conference showcased examples of these outcomes and provided opportunities for discussion and future collaboration.

The keynote address was delivered by Dr. Tom Ballestero, the principal investigator and senior scientist at the University of New Hampshire Stormwater Center. The UNH Stormwater Center researchers like to be known as LID Myth Busters because their research has shown that LID techniques function in cold, harsh climates, are cost effective or exhibit better volume reduction or pollutant removal capabilities than previously thought. Dr. Ballestero’s presentation was a great reminder that choosing low impact development BMPs is the same as other decision-making processes. The first step is to identify the goals.

Common goals of stormwater management are flood control, water quality protection, and channel or habitat protection. Low impact development is

considered to primarily protect water quality and channel integrity. However when used on a watershed scale, LID may provide some flood control and water supply benefits. To achieve maximum benefit from stormwater volume controls at the source, regulations and BMP selection should align with a community’s goals for protecting receiving water and habitat from impairment. For example, if a community has water quality impairment from metals associated with vehicles and car habitat, then including volume LID techniques such as bio swales near parking lots and street trees can help achieve water protection goals.

In addition to a performance summary of the BMPs that UNH is researching, Dr. Ballestero offered some insight about the economic and social benefits of source volume controls. There are many opportunities for low impact development techniques to be integrated in a manner that adds value by creating attractive spaces with multiple functions. For example, porous pavement can serve both vehicle and stormwater management



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needs. A bioswale or porous landscape detention area can provide habitat benefits, serve as a relaxing break area for employees in an office building and also provide stormwater management benefits such as detention or water quality. Additionally, an economic assessment that includes construction and maintenance costs does not account for social value. For example, stormwater management techniques such as permeable pavers, a green roof or a bioswale may cost more to construct compared to a conventional drainage system or a conventional roof. However, properties with these techniques often have higher social appeal and value, which may be reflected in higher sale/lease prices, visitation rates, and decreased vacancy rates. These benefits may offset or exceed these initial construction costs. While social capital has been around as long as people and communities have been around, quantification and guidance on how to design and build for maximum long-term economic, social, and environmental value is rapidly emerging.

Whether attendees were beginning to learn about runoff reduction techniques or have experience implementing LID practices, Dr. Ballestero's

address offered a great foundation of understanding and conceptual framework for the LID presentations. The presentations on BMP research, case studies, costs, maintenance, benefits and barriers generated great questions, conversations; and likely, additional research and collaboration. After a day of presentations, about two dozen LID aficionados** participated in the walking tour of downtown Crested Butte. The tour was organized by Brian Murphy and lead by Dr. Ballestero and the Crested Butte senior planner. It was an on-the-ground and periodically in-the-rain discussion of Crested Butte's stormwater issues and how land development and stormwater are managed in a harsh climate dominated by snowpack hydrology. We had the opportunity to brainstorm what LID techniques could be used in new development or included as a retrofit to meet Crested Butte's goals.

I purposely did not mention or highlight any technical presentations in this summary, as doing so would invariably leave out a valuable piece of work or discussion by our colleagues. Perhaps this short summary will encourage all of us to have a look at the CD of presentations in the CASFM binder

and talk with our colleagues. Additionally for those on the Stormwater Quality Committee or for those who would like to be involved, Urban Drainage and Flood Control District is updating Volume 3 of the Criteria Manual. As part of this process, the District conducted a survey on land development and stormwater management. The responses as well as progress meeting notes are posted on the District's website: http://www.udfcd.org/downloads/down_critmanual_update.htm

Please contact me with your thoughts and questions and thank you for the opportunity to serve as the Stormwater Quality Committee Chair.

Michelle can be contacted at Michelle.DeLaria@att.net or 303.324.0623

** LID and volume source controls should be considered part of an integrated stormwater management program and not as a replacement for large storm detention or flood control programs.*

*** OK. I know some people really wanted to go bike riding, but the weather was lousy and some other people were in it for the window shopping. Whatever your reason, we were happy to have you join us.*



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Members' Corner

We will introduce a members' news column with the next addition. If you have recently joined CASFM, moved to Colorado, changed jobs, or careers, proud parent of a recent college graduate, experienced a wonderful vacation, had an epiphany on floodplain management or any item you'd like to share, send me an email, David Mallory at dmallory@udfcd.org. If there is enough interest we'll do the column. Please feel free to anonymously submit a news item on behalf of a colleague, just be aware I'll clear it with the colleague before we print it. Member's career milestones and professional achievements should be shared and applauded.



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General Membership Meetings



Consider taking a more active role in CASFM by attending the general meetings. Have a voice in annual conference planning, spending priorities, training and much more. Meetings are held every two months (odd numbered-months) at a variety of venues. The next meeting will be held on Thursday, July 9th at Sandstone Ranch, Longmont. Meeting details, directions and so forth are posted on the web site. All meetings are announced by an email blast to the membership. Great opportunity to stay connected and involved!

Committee News

CRS Committee Celebrates One Year Anniversary

In March, The CRS committee will celebrate its one year anniversary. The committee was involved in several activities during 2009. One of the biggest achievements was hosting an Introduction to CRS workshop in Longmont in November 2008. Over 60 people attended with attendees coming from as far away as Limon, Breckenridge and Casper Wyoming. French Wetmore, one of the original designers of the CRS program, and Kerry Redente, the CRS Specialist for Colorado discussed the activities credited under the CRS. They offered suggestions to both those communities thinking about joining the CRS program as well as those that were already participating and were looking for ways to improve their scores.



French Wetmore discussing the CRS during the November, 2008 workshop in Longmont, CO.

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Committee News

2009 CRS Training Opportunities

Based on the success of the November 2008 Longmont Workshop, several other training opportunities are planned for 2009. These include:

Elevation Certificate Training and Flood Insurance

City of Aurora City Council Chambers,
15151 E. Alameda Parkway, Aurora
Held: April 30th

Topics covered:

- Background on the National Flood Insurance Program.
- How to properly complete an Elevation Certificate.
- How the Elevation Certificate impacts flood insurance premiums.
- How elevation certificates are reviewed during a CRS audit.
- Common mistakes in completing the elevation certificate.
- Local floodplain administrator's responsibilities for reviewing elevation certificates.

Speakers will include Tom Birney and Dave Jula from Michael Baker Corporation, Norm Ashford from FEMA Region VIII, and Kerry Redente representing the CRS program.

Since maintaining elevation certificates is one of the prerequisites for joining the CRS program, the CRS

Committee thought this would be a good in-depth training opportunity. Surveyors, Floodplain Administrators and Community CRS coordinators will benefit from this class.

Introduction to the CRS –West Slope

CDOT Facility, Grand Junction, CO
June 30th

Topics to be covered:

- How to join the CRS.
- Benefits of joining the CRS.
- Activities covered under the CRS.
- Local community perspective on the CRS.

Speakers will include French Wetmore and Kerry Redente representing the CRS program.

This course will be the similar to the one presented in Longmont in November. Local floodplain administrators, public officials and consultants that assist communities will benefit from this workshop. Communities interested in joining the CRS are highly encouraged to attend.



Participants enjoy the 2008 Annual Conference.

Annual Conference

Kerry Redente will be available for one-on-one visits with local communities to answer questions on the CRS.

Check the CRS Committee section of the CASFM Website for updates. Registration for the Elevation Certificate and West Slope CRS Workshop will be handled by Cristina Martinez with the CWCB, cristina.martinez@state.co.us.

The CASFM CRS Committee has also been providing feedback to the

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CRS Task Force to offer suggestions on ways to improve the CRS program. These suggestions are available on the CASFM CRS Committee website.

The committee is always looking for new members. Please contact the CRS Committee Chair, Marsha Hilmes-Robinson, mhilmesrobinson@fcgov.com, if you would like to be added to the e-mail list to be notified of upcoming committee meetings and CRS information.

Committee News

Training Committee

The committee launched a web-based training survey in order to gauge interest in short (half day to one day) training courses. The survey also asked about courses connected to the annual conference and/or offerings throughout the year, and a variety of course topics.

How about a "Barstool Series"? The idea is a two-hour training session on a variety of topics with a social event to follow. The training sessions could be coupled with regional socials or not. The committee is still working on venue and cost details. Any of the courses offered will be pre-approved for CFM credits.

Other training opportunities could include offerings from ASFPM as they roll out new courses throughout this year.

Outreach Committee

The Outreach Committee currently has the following members: Brandon Luster, Marcia Sorensen, Ken Cecil, and Ken MacKenzie. We are working together with the Training Committee to bring the CASFM membership a new training/social series dubbed the "Barstool Series". Other notable outreach projects include updating the CASFM brochure we make available at conferences and other events, and having a CASFM presence at the annual at the annual CML conference in Steamboat Springs this summer.

Stormwater Committee

The Stormwater Committee is actively participating in the District's update of the Urban Storm Drainage Criteria Manual Volume 3 "Best Management Practices". Michelle DeLaria has finished her tenure at the District, but will thankfully remain as Chair of the Stormwater Committee.

Planning has begun for the Annual CASFM Water Quality Field Trip, scheduled for mid-June. The committee is canvassing members on potential sites. As in the past, the field trip is an all day event via chartered bus leaving from and returning to District offices (free parking!). Check the web site for details; it's a great chance to get your feet wet!

Scholarship Committee

CASFM offers two scholarships each year. The CASFM-UWRI Scholarship is funded by the Urban Watersheds Research Institute (UWRI) and is awarded to an undergraduate student in the field of Civil Engineering enrolled in an ABET accredited College or University in the state of Colorado. The CASFM-Ben Urbonas Scholarship was established in 2002. It was renamed to the CASFM-Ben Urbonas Scholarship in 2008 to honor its namesake for his more than 30 years of service to both Colorado and the Nation with his pioneering work in the fields of Stormwater Quality and Floodplain Management. This scholarship is awarded to a graduate level student studying in a field closely related to the goals of CASFM.

The Scholarship Committee has received a number of applications for both scholarships. Final selection will be completed in the near future.

Floodplain Committee

The Floodplain Committee is sponsoring two special training/testing sessions for CFM certification. The first was held at Urban Drainage and Flood Control District on April 1st and 2nd. The second session is scheduled for May 27th and 28th in Longmont. Please check www.casfm.org for details and registration information. Cristina Martinez with the Colorado Conservation Board (CWCB) is proctoring both sessions. Our thanks to Christina and CWCB for these training/testing opportunities.

The CFM certification will be proctored at the National Hydrologic Warning Council Conference in Vail, May 19th through 21st (check the web site for details). The exam will also be offered at the CASFM Annual Conference in Crested Butte, tentatively September 15th and 16th.

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Regional News

Metro Denver Region

On December 10, 2008 a two-part social was held in downtown Denver. We first met at a pervious pavement demonstration project on the University of Colorado-Denver's Auraria Campus. Angela Hager of UCD discussed the project. Following the site visit, we met at Dixon's Downtown Grill, where Ken MacKenzie of the Urban Drainage and Flood Control District presented the results of materials testing study of existing pervious pavement locations. Approximately 35 people attended, including some non-CASFM members at the demonstration project site.

The latest Denver Metro Area social was held on April 14, 2009 at the Rock Bottom Brewery in Englewood. Mark Glidden with CH2M Hill and Alan Taylor discussed the South Boulder Creek Floodplain Mapping Study. A truly amazing study process, thanks to both of our presenters.

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Southeast Region

Danny Elsner, who has since accepted an engineering position in Denver, organized a social event held on Dec. 11, 2008, with 11 in attendance. Elizabeth Staten has accepted the appointment to replace Danny as regional representative. Thanks Danny for your service to CASFM in the Southeast Region, we'll see you in Denver!

Southwest Region

Turns out some of our colleagues in the southwest region are consumed with the implementation of new oil and gas regulations. May you return to the earth's surface in the near future!

Northeast Region

A LID-focused social is in the works for April or May. The event may be held in Greeley or Loveland, stay tuned for details.

Northwest Region

John Kornfield organized a social held on December 5, 2008, with a tour of the Ranchmen's Ditch Flood Control Project in Grand Junction. There were approximately 25 attendees, including non-CASFM members. The next social may include LID training and could be held in Montrose in order to attract Southwest Regional Members as well.

The Northwest Region is hosting the CRS training class scheduled for June 30, 2009 at CDOT's Grand Junction office.



Colorado Flood Forecast

By Kevin Houck, Chair CASFM

The Colorado Water Conservation Board chairs the Flood Task Force (FTF), which meets periodically during the spring and summer seasons to monitor snowpack and flood potential. The first meeting of the FTF was held on Thursday, March 12th. At this meeting, the current snowpack scenario was presented, and medium and long-range weather and climate forecasts were issued. It was noted that although high-elevation snowpack was above average for most of the winter, low-elevation snowpack has been absent, with much of the snow below 9,000 already melted. Climate forecasters have indicated the likelihood for a warm and dry spring (relative to climatological norms) for most of the state, with the general trend of that experienced in early March continuing through the runoff sea-

son. According to forecasters, the best chance for wetter conditions exists on the southeast plains, whereas drier conditions are forecasted for the southwestern portion of the state as well as most of the northern tier.

Thus far, March has shown a steep drop off in snowpack. On March 1st, all major river basins with the exception of the South Platte River had readings above average. By March 23rd, this had changed and all major river basins were at or below average for the date. While this may mitigate the threat for snowmelt flooding, it is unfortunate for those involved in water supply, as it may lead to drought conditions that are unfavorable for both water supply and wildfire threat.

Climate researchers are indicating the likelihood

that the current La Nina scenario may shift to a more neutral pattern, or it may shift completely to a weak El Nino by summer. According to these climate researchers, past seasons that have followed this shift (which include 1976 and 1997) have shown an increased tendency for flash flood inducing rainfall during the summer months.

The danger for wildfires looks to be especially high this summer. In addition to the rapidly-disappearing snowpack and warm, dry forecast, additional dangers, such as beetle kill are present. Flood professionals take an active interest in wildfires as it significantly exacerbates flood potential downstream of the burn scars. In fact, the majority of damaging floods experienced in Colorado since 2000 have been post-wildfire floods.

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The Open Channel

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My sincere thanks to everyone who contributed articles to this edition of Open Channel and helped with content review. Please send newsletter comments and suggestions to dmallory@udfcd.org.

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